

WHAT IS CLAIMED IS:

SUB A17

1. A method for providing a recommendation list from a plurality of items, comprising the steps of executed in a data processing system:
  - specifying a constraint filter to select ones of the items satisfying a constraint;
  - selecting the ones of the plurality of items that satisfy the constraint filter;
  - computing predicted values based on a recommendation filter, for the selected ones of the items; and
  - appending the selected ones of the items meeting predetermined criteria.
2. The method of claim 1, wherein appending selected ones of the items further includes appending the selected ones of the items to the recommendation list when the predicted value exceeds a predetermined number.
3. The method of claim 1, wherein appending selected ones of the items further includes appending a predetermined number of items to the list.
4. The method of claim 1, wherein selecting the ones of the items that are restricted further includes applying a constraint containing free variables to the ones of the items.

5. The method of claim 1, wherein selecting the ones of the items that are restricted further includes applying a constraint containing bound expressions.

6. The method of claim 1, wherein selecting the ones of the items that are restricted further includes applying a boolean constraint filter.

7. The method of claim 1, wherein selecting the ones of the items that are restricted further includes applying a constraint to the ones of the items item, wherein the constraint signifies an equality.

8. The method of claim 1, wherein selecting the ones of the items that restricted further includes applying a constraint to the ones of the items, wherein the constraint signifies category membership.

9. The method of claim 1, wherein computing a predicted value further includes evaluating the selected ones of the items with collaborative filtering.

10. The method of claim 1, further comprising the step of truncating the recommendation list when a predetermined number of the selected ones of the items on the recommendation list has been met.

<sup>11</sup>  
~~12.~~ The method of claim 1, wherein selecting the ones of the items that are restricted by the constraint filter further includes

obtaining data from a user; and

adding the data to the constraint filter.

<sup>12</sup>  
~~13.~~ The method of claim 1, wherein specifying a constraint filter further includes

obtaining the constraint from an operator; and

storing the constraint filter in memory.

14<sup>13</sup> A method for applying a recommendation filter and a constraint filter to a plurality of items in a data processing system, comprising the steps of:

- receiving a recommendation request from a user;
- specifying a constraint filter to select ones of the items satisfying a constraint;
- determining the order of the filters based on a cost of the filters;
- applying the constraint filter first when the cost of the constraint filter is lower than the cost of the recommendation filter; and
- applying the recommendation filter first when the cost of the recommendation filter is lower than the cost of the constraint filter.

15<sup>14</sup> The method of claim 14<sup>13</sup>, wherein determining the order of the filters further includes analyzing the cost for applying the filters to the ones of the items; and determining the probability that the ones of the items will pass both filters.

16<sup>15</sup> The method of claim 15<sup>14</sup>, further comprising:

- solving the following equation for the cost to apply to each filter:

$$C = M / P (G + R),$$

wherein M is a number of desired items, P is the probability that the ones of the items will pass the second filter, G is the time to retrieve the ones of the items, and R is the time to decide if the ones of the items will pass the second filter.

SUB A27

<sup>16</sup>  
~~17.~~ An apparatus designed to provide a recommendation list from a plurality of items in a data processing system, comprising:

a processing component configured to process instructions for:

applying a constraint filter to ones of the items;

applying a recommendation filter to ones of the items, and

determining an order of the filters to apply to the plurality of the items; and

a recommender component configured to append the filtered ones of the items to a recommendation list based on the constraint filter and recommendation filter.

<sup>16</sup>  
<sup>17</sup>  
~~18.~~ The apparatus of claim ~~17~~, wherein the processing component computes predicted values based on the recommendation filter.

<sup>16</sup>  
<sup>18</sup>  
~~19.~~ The apparatus of claim ~~17~~, wherein the processing component further determines the order of the filters to apply to the plurality of the items based on the cost of the filters;

applies the constraint filter first when it is determined that the cost of the constraint filter is lower than the cost of the recommendation filter; and

applies the recommendation filter first when it is determined that the cost of the recommendation filter is lower than the cost of the constraint filter.

<sup>19</sup>  
20. The apparatus of claim <sup>16</sup>17, wherein the processing component applies a constraint filter based on a boolean constraint containing free variables.

<sup>20</sup>  
21. The apparatus of claim <sup>16</sup>17, wherein the processing component applies a constraint filter containing bound expressions.

<sup>21</sup>  
22. The apparatus of claim <sup>16</sup>17, wherein the processing component applies a constraint filter based on a boolean constraint.

<sup>22</sup>  
23. The apparatus of claim <sup>16</sup>17, wherein the processing component applies a constraint filter that signifies category membership.

<sup>23</sup>  
24. The apparatus of claim <sup>16</sup>17, wherein the processing component applies a constraint filter that signifies an equality.

<sup>24</sup>  
25. The apparatus of claim <sup>16</sup>17, wherein the processing component computes predicted values by evaluating each ones of the items with collaborative filtering.

<sup>25</sup>  
26. The apparatus of claim <sup>16</sup>17, wherein the recommender component is further configured to truncate the recommendation list when a predetermined number of the ones of the items on the

recommendation list has been met.

<sup>26</sup>  
27. The apparatus of claim <sup>16</sup>17, further comprising an input component configured to:  
obtain the constraint from an operator; and  
store the constraint filter in a memory.

<sup>27</sup>  
28. The apparatus of claim <sup>16</sup>17, further comprising an input component configured to:  
obtain data from a user; and  
add the data to the constraint filter.

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ADD B47